AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the Application. No new matter has been introduced by way of the claim amendments. Current additions to the claims are noted with underlined text. Current deletions from the claims are indicated by text ~~strikethrough~~ or [[double bracketing]]. The status of each claim is indicated in parenthetical expression following the claim number.

What is claimed is:

1. (Currently Amended) A method for selectively functionalizing carbon nanotubes, wherein the method comprises ~~comprising~~:

a) suspending a plurality of carbon nanotubes in a solvent to provide a plurality of suspended carbon nanotubes; ~~and~~

wherein the plurality of suspended carbon nanotubes comprise metallic carbon nanotubes, semimetallic carbon nanotubes and semiconducting carbon nanotubes; and

b) reacting a substoichiometric amount of a functionalizing species with the plurality of suspended carbon nanotubes;

wherein the substoichiometric amount of the functionalizing species is selected such that a preferential reaction of the functionalizing species occurs with metallic and semimetallic carbon nanotubes over semiconducting carbon nanotubes ~~such that a portion of the carbon nanotubes react preferentially with the functionalizing species based on the electronic properties of the carbon nanotubes comprising said portion~~.

2. (Currently Amended) A method for selectively functionalizing carbon nanotubes, wherein the method comprises ~~comprising~~:

a) suspending a plurality of carbon nanotubes in a solvent to provide a plurality of suspended carbon nanotubes; ~~and~~

wherein the plurality of suspended carbon nanotubes comprise metallic carbon nanotubes, semimetallic carbon nanotubes and semiconducting carbon nanotubes; and

b) reacting a substoichiometric amount of a diazonium species with the plurality of suspended carbon nanotubes;

wherein the substoichiometric amount of the diazonium species is selected such that a preferential reaction of the diazonium species occurs with metallic and semimetallic carbon nanotubes over semiconducting carbon nanotubes ~~such that a portion of the carbon nanotubes react preferentially with the diazonium species based on the electronic properties of the carbon nanotubes comprising said portion~~.

3. (Currently Amended) A method for selectively functionalizing carbon nanotubes, wherein the method comprises ~~comprising~~:

a) adding a plurality of carbon nanotubes to an aqueous surfactant solution and homogenizing to form a mixture of surfactant-suspended carbon nanotubes; ~~and~~

wherein the mixture of surfactant-suspended carbon nanotubes comprises metallic carbon nanotubes, semimetallic carbon nanotubes and semiconducting carbon nanotubes; and

b) reacting a substoichiometric amount of a diazonium species with the mixture of surfactant-suspended carbon nanotubes;

wherein the substoichometric amount of the diazonium species is selected such that a preferential reaction of the diazonium species occurs with metallic and semimetallic carbon nanotubes over semiconducting carbon nanotubes ~~such that a portion of the carbon nanotubes react preferentially with said diazonium species based on the electronic properties of the carbon nanotubes comprising said portion~~.

4. (Currently Amended) The method of Claims 1, 2 or 3, wherein the carbon nanotubes are selected from the group consisting of single-wall carbon nanotubes, multi-wall carbon nanotubes, double-wall carbon nanotubes, and combinations thereof.

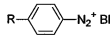
5. (Currently Amended) The method of Claims 1, 2 or 3, wherein the carbon nanotubes are single-wall carbon nanotubes.

6. (Original) The method of Claim 3, wherein the surfactant is selected from the group consisting of ionic surfactants, non-ionic surfactants, cationic surfactants, anionic

surfactants, sodium dodecyl sulfate (SDS), sodium dodecylbenzene sulfonate (SDBS), sodium octylbenzene sulfonate, TRITON X-100, TRITON X-405, dodecyltrimethylammonium bromide (DTAB), and combinations thereof.

7. (Currently Amended) The method of Claims 2 or 3 ~~2-5 or 6~~, wherein the diazonium species is an aryl diazonium salt.

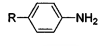
8. (Original) The method of Claim 7, wherein the aryl diazonium salt comprises:



and wherein R is selected from the group consisting of halogen, nitro, cyano, alkyl, aryl, arylalkyl, OH, carboxylic ester, carboxylic acid, thiocarbonate, amide, alkoxy, polyether, polyalkyl, hydroxyl alkyl, and combinations thereof.

9. (Currently Amended) The method of Claims 2 or 3 ~~2-5 or 6~~, wherein the diazonium species is generated *in situ* by reacting a substituted aniline species with an alkyl nitrite.

10. (Currently Amended) The method of Claim 9, wherein the substituted aniline species has a general formula



and wherein R ~~(the substituent, or substituents in the case of multiple substitutions)~~ is selected from the group consisting of halogen, nitro, cyano, alkyl, aryl, arylalkyl, OH, carboxylic ester, carboxylic acid, thiocarbonate, amide, alkoxy, polyether, polyalkyl, hydroxyl alkyl, and combinations thereof.

11. (Currently Amended) The method of Claim ~~8 or 10~~, wherein R is OH.

12. (Currently Amended) The method of any one of Claims 1 - 3 ~~1-10, or 11~~, further comprising a step of thermal defunctionalization to regenerate separated, unfunctionalized carbon nanotubes.

13 – 24 (Cancelled).

25. (New) The method of Claim 10, wherein R is OH.